

Specialized and Interdisciplinary Centers

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6.1 Introduction

The establishment of scientific and research centers of excellence in most Egyptian universities is one of the most important outputs of HEEPf projects financed in the first phase. These specialized centers contribute in the upgrading of scientific and laboratory skills of students in different fields. They also enhance the concept of development and self-sustainability in a tangible form. They reached 59 centers distributed on 15 Egyptian universities including the different sectors of higher education (Engineering, Medical, Agricultural and Veterinary Medicine, Basic Sciences, and Theoretical Specializations Sectors) as shown in Figure (6.1)

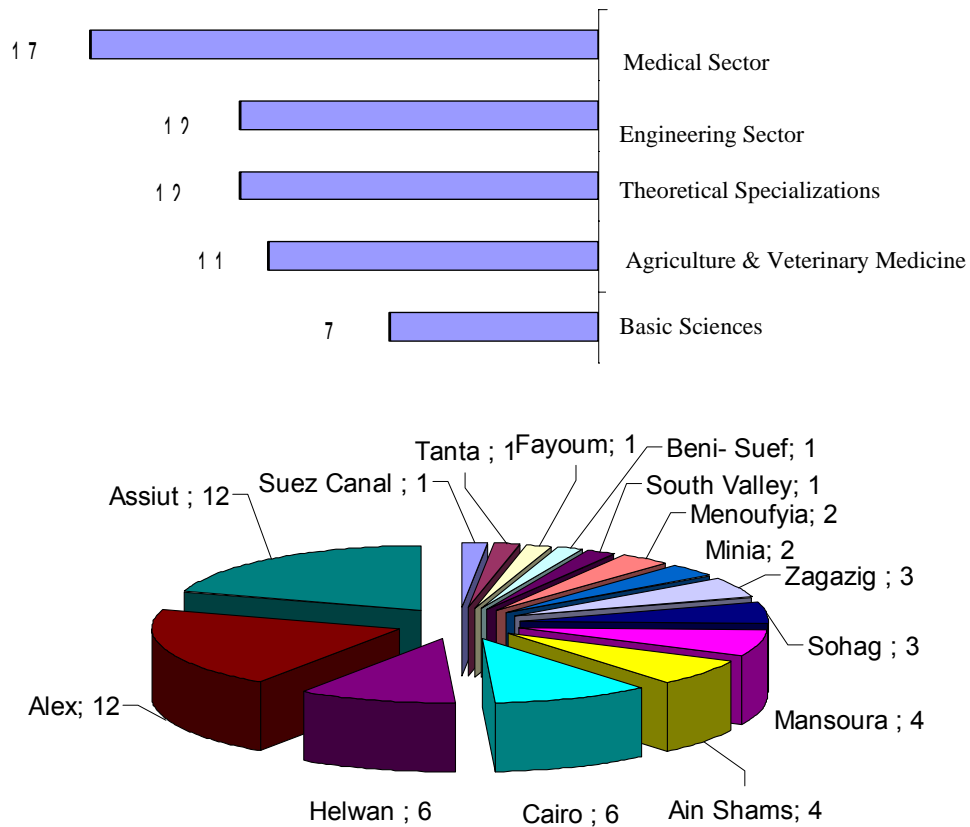


Figure (6.1): Specialized Centers distributed according to specialization and university

6.2 Specialized Centers in the Medical Sector

The Medical Sector had 17 specialized centers as above mentioned distributed on the universities as follows:



Fig. (6.2): Project (C-091-H0) Training lab in the Medical Research Institute

University	No. of Centers
Alex.	6
Cairo	4
Assiut	2
Mansoura	2
Zagazig	1
Suez Canal	1
Suhag	1

The Technicians' Training Center on Medical Equipment Maintenance in the Medical Research Institute established through Project (C-091-H0) is considered one of these specialized centers in Alex. Univ. The center aims at training technicians and medical laboratory specialists on maintaining medical equipment. The number of trainers reached 482 trainers, which reflects the great success of this center. In this project, a training team of staff members, instructors, engineers, and technicians was prepared. Moreover, three labs equipped with training medical and lab equipment, as well as audio-visual training assistance were established, and mechanic and electronic workshops were equipped (Figure 6.2). In addition, various training courses and workshops were held in the field of equipment maintenance of which 578 technicians and engineers benefited. A number of seminars and workshops were also held to train students in the Equipment Maintenance Department in the Health Technical Institute in Alex.

In the field of Pediatric Medicine, Alex. Univ. Center for early Identification and Intervention of Childhood Disabilities was established through Project (D-083-H0) in the Pediatric Medicine Department of the Faculty of Medicine, Alex. Univ. The following institutions shared in the implementation of this project activities:

1. Natural Medicine, Society Medicine, and Ophthalmology Departments as well as the Speech Therapy Unit in the Faculty of Medicine, Alex. Univ.
2. Faculty of Kindergarten, Alex. Univ.
3. Faculty of Nursing, Alex. Univ.
4. Higher Institute for Social Service, Alex. Univ.
5. Higher Institute for Public Health, Alex. Univ.
6. Faculties of Athletic Education in Alex. and Helwan Universities.
7. Faculty of Natural Therapy, Cairo Univ.

The participants also include a number of civil organizations in Alex. (City Center for Training and Studies of Disability, Knoz Center for Early Intervention, the Qualifying Center affiliated to Ali bin Abi Taleb Society, Repercussions Society)



Fig. (6-3): Project (D-083-H0) The electronic site for the Center of Early Identification and Intervention of Childhood Disabilities

The third center in the Medical field in Alex. Univ. is the educational center of excellence for Dentists established through project (D-181-H0) in cooperation with the Dentists' Syndicate in Alex (Figure 6.4). The center aims at teaching new courses that have never been taught before in the Faculties of Dentistry (Genes, Tissue Engineering, Chinese Injections Engineering, Computer Assisted Learning) using modern teaching methods. 150 dentists have been taught these courses up till now.



Fig. (6-4): Examples of equipment used in the education center of excellence for Dentists (Project D-181-H0)

The fourth specialized center in the Medical field in Alex Univ. is the advanced Medical Biological Physics center established through Project (D-185-H0) (Figure 6.5) in collaboration with the Higher Institute for Health, Faculties of Medicine, Dentistry, Pharmacy, Science, and Nursing in Alex. Univ. using a distinguished administrative system. In addition to the advanced center, advanced theoretical and practical scientific courses were developed and new applications of this advanced technology were made for students in the participating faculties, which upgrades undergraduate and postgraduate students' skills. Moreover, a new postgraduate diploma was introduced and new academic programs were developed for the Master's Degree and Doctorate.

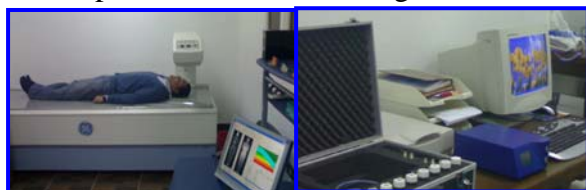


Fig. (6-5): An advanced center in the field of Medical Biological Physics in the Medical Research Institute, Alex. Univ. (Project D-185-H0)

The fifth of these centers is the Training Center on Air Passages Treatment established in the Faculty of Medicine in Alex. Univ. through Project (D-190-H0) (Figure 6.6). This center aims at holding organized training courses for the treatment of different cases of Air Passage diseases.



Figure (6-6): The website of the training center for the treatment of Air Passage diseases, Faculty of Medicine, Alex. Univ. (Project D-190-H0)

The final specialized center in the Medical field in Alex. Univ. is the Museum for the Development of Anatomy Teaching Methods established through Project (D-183-H0) (Figure 6.7). This museum is considered one of the necessary alternatives for the development of students' anatomy skills, given the continuous increase in the number of students in the Faculty of Medicine.



Figure (6-7): Examples of samples in the museum of the Faculty of Medicine, Alex. Univ. (Project D-183-H0)

In Cairo Univ., four specialized centers have been established in the medical field. Through Project (A-062-J0), an x-ray film library was established in the Department of Radiation (Figure 6.8). It is considered unique in Egypt because it extended the circle of beneficiaries due to the easy search using electronic methods and the distance learning service offered through the computer which led to the improvement of educational service for students.



Fig. (6-8): The x-ray digital film library in the Faculty of Medicine, Cairo Univ. (Project A-062-J0)

Through Project (A-107-J0), a training center on clinical skills was established to improve the learning environment in the Faculty of Medicine, Cairo Univ. Information technology is used in training in this center (Figure 6.9). The center aims at providing students in the Faculty of Medicine with an opportunity to gain knowledge and clinical and informational skills required to qualify them for practical life as effective physicians in the society. The center also aims at providing the e-learning and distance learning opportunity for students of Kasr El Eini Faculty of Medicine as well as other faculties inside and outside Egypt. Moreover, it aims at developing the skills of staff members and their assistants in the fields of new teaching methodology and information technology to be able to use these methods in teaching.



Fig. (6-9): Models in the training center for clinical skills in the Faculty of Medicine, Cairo Univ. (Project A-107-J0)

In addition, attaining and learning center for the care for valvulitis patients was established in the Faculty of Medicine, Cairo Univ. through Project (C-013-J0) (Figure 6. 10). The center aims at:

- Training physicians clinically on the fast and accurate diagnosis of microbe valvulitis and the quick demand of laboratory tests.
- Training ultrasonic waves physicians on the fast and accurate diagnosis using ultrasonic repercussions.
- Training physicians and technicians on doing microbe agricultures with an aim to increase the return of agricultures to enhance the accurate choice of antibiotics.
- Introducing the latest methods of laboratory diagnosis (measurement of antibodies in vaccine as well as diagnosis using biology)



Fig. (6-10): The work team in the center of education and training for the care for valvulitis patients in the Faculty of Medicine, Cairo Univ. Project C-013-J0)

As for the fourth specialized lab in the medical field in Cairo Univ., it is a center for integrating evidence-based medicine into the staff members' skills development programs and postgraduate curricula through project (B-120-J0). The center aims at building a technical and administrative structure for training staff members in the Faculty of Medicine on the health practices' skills based on scientific evidence as well as preparing them to teach evidence-based medicine to postgraduates and undergraduates. The center also aims at integrating

evidence-based medicine as a content of curricula of postgraduate studies, technical training, and undergraduate stage. Table (1) shows the number of trained staff members, undergraduates, and postgraduates.

Category	No.
Staff members	464
Franchise Students	600
Undergraduate students	100
Postgraduate students	2100

Table (1): The number of the trained in the center for integrating evidence-based medicine in the Faculty of Medicine, Cairo Univ. (Project B-120-J0)

In Assiut Univ., two centers were established in the medical field. The first is for training on speculum surgeries through Project (B-047-I0) (Figure 6.11) in the Faculty of Medicine. It aims at training students on speculum surgeries to upgrade their practical level.



Fig. (6-11): Center for training on speculum surgeries, Assiut Univ. (Project B-047-I0)

The second is Drugs Information Center established in the Faculty of Pharmacy, Assiut Univ., through Project (C-066-I0) to provide information about the latest drugs and their uses and publish a periodical in the field of drugs (Figure 6.12).



Fig. (6-12): Drugs Information Center, Faculty of Pharmacy, Assiut Univ. (Project C-066-I0)

In Mansoura Univ., Project (B-092-L0) contributed in the support of some aspects of continuous institutional development of medical education in the Kidney Diseases Center in Mansoura Univ. (Figure 6.13). It can be undoubtedly considered one of the pioneering applications in this field. Surgical training was developed through equipping the conference hall in the University with an audio-video system that allows filming and transmitting surgeries that take place at the operation rooms to the conference hall. In addition, training courses were held in different urinary passage surgeries. Through the project, an operation room for test animals was also developed.



Fig. (6-13): The continuous institutional development of medical education through the Kidney Diseases Center, Mansoura Univ. (Project B-092-H0)

The second project in the medical field in Mansoura Univ. is the establishment of Life Saving and Support Center in the Faculty of Medicine through Project (B-089-H0). The center is considered a center for training and serving the community and aims at spreading the culture of life saving and support among students in medical and other faculties in Mansoura Univ. and effective groups of the community like Talkha Fertilizer Factory (Figure 6.14).



Fig. (6-14): Life Saving and Support Center, Faculty of Medicine, Mansoura Univ. (Project B-089-H0)

In the Faculty of Medicine, Zagazig Univ., a Disaster and Crisis Management Unit was established through Project (A-029-T0) (Figure 6.15). The unit offers training courses and programs for workers in related bodies in case of crises or disasters. It aims at training several categories like ambulance men and physicians at Reception Departments to spread awareness of the medical rules and principles that should be followed to confront disasters.



Fig. (6-15): Disaster and Crisis Management Unit, Faculty of Medicine, Zagazig Univ. (Project A-029-T0)

In Suez Canal Univ., a center for training on burn treatment was established in the Faculty of Medicine through Project (D-135-Q0) to continually improve education in the field of burn treatment and care (Figure 16). The center signed protocols for cooperation with Ismaleya Public Hospital. It trained several health units in the region of Suez Canal and Sinai.



Fig. (6-16): center for training on burn treatment, Suez Canal Univ. (Project D-135-Q0)

6.3 Specialized Centers in the Engineering Sector

The Engineering sector got 12 specialized centers distributed on 8 universities. In Assiut Univ., a center for distance learning using video conference was established between the Faculties of Information and Technology in Assiut and Cairo Universities through Project (D-091-I0). This center is unique in giving lectures simultaneously through the internet to the two universities' students through video screens and an electronic board. This system allow interaction through the internet (Figure 6.17).



Fig. (6-17): center for distance learning using video conference, Assiut Univ. (Project D-091-I0)

In the Sugar Research and Studies Institute, Assiut Univ., an analysis and measurement center was established through Project (A-084-I0). It aims at training postgraduates and workers in sugar refinery factories on agricultural, chemical, and engineering aspects necessary for different manufacturing stages (Figure 6.18).



Fig. (6-18): Analysis and measurement center, the Sugar Research and Studies Institute, Assiut Univ. (Project A-084-I0)

In Assiut Univ., a center for disassembling old scientific equipment and using whatever is useful in maintaining other equipment was established through Project (A-083-I0). Technicians were also synchronously trained on maintaining scientific equipment and establishing a database for the equipment available at the university. The center aims at reducing the maintenance expenditure of university equipment and using the available resources (Figure 6.19).



Fig. (6-19): Center for disassembling old scientific equipment, Assiut Univ. (Project A-083-I0)

In the Faculty of Engineering, Cairo Univ., the Energy Research Center was enhanced in the field of training on advanced and applied systems and designing laboratory experiments through Project (A-253-J0) (Figure 6.20). The Project Management contacted service agencies to learn about their needs and qualify graduates by giving them the required scientific and laboratory skills to deal with automatic control and measurement technology. A cooperation protocol was signed with the Eastern Company for Tobacco, the Holding Company for Vaccines, and the Ministry of Electricity.



Fig. (6-20): Examples of the contents of the center for training on advanced and applied systems, Faculty of Engineering, Cairo Univ. (Project A-253-J0)

In the framework of connecting the education enhancement process with the fields of scientific research, a center for using centrals in Civil Engineering was established in the Faculty of Engineering, Mansoura Univ., through Project (B-091-L0). The center, one of its kind in the Middle East, aims at transferring a virtual image of laboratory experiments to students' mind (Figure 6.21). It enables students to watch the process of performing experiments, getting results, and following up their analysis through the internet. The whole course together with questions, problems, and examples of field experiments are presented to students through the internet. In addition, an information database was prepared to form the basis of virtual labs in which students do experiments using the computer.

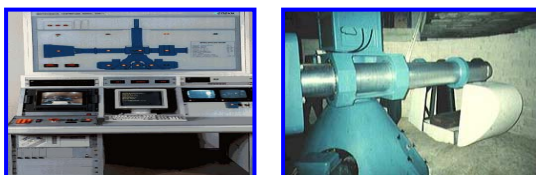


Fig. (6-21): Education enhancement center in the fields of scientific research, Faculty of Engineering, Mansoura Univ. (Project B-091-L0)

In the Faculty of Applied Arts, Helwan Univ., an Ergonomic designing information center was established through Project (D-133-K0) (Figure 6.22). The center aims at increasing human competent and efficient interaction with products, tools and work environments. It also aims at enhancing various human values, increasing security and comfort considerations in products' use, increasing the standard of living for both the disabled and the normal. In addition, it aims at reducing the number of accidents and the amount of suffering and pressure that people experience. The center gives designers important information about human measurements in standard timetables and digital simulation of different parts of the human body. It also trains students in the faculty on digital simulation and develops courses and educational media in the field of Ergonomics.

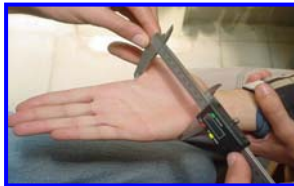


Fig. (6-22): Ergonomic designing information center, Faculty of Applied Arts, Helwan Univ. (Project D-133-K0)

In the Faculty of Engineering, Ain Shams Univ., a center for the development of Luminary Communication Technology and Electro-luminary Engineering Education and a consultancy unit were established through Project (B-040-G0) (Figure 6.23). The center aims at offering excellent service for civil and military applications in the field of Luminary Communications.

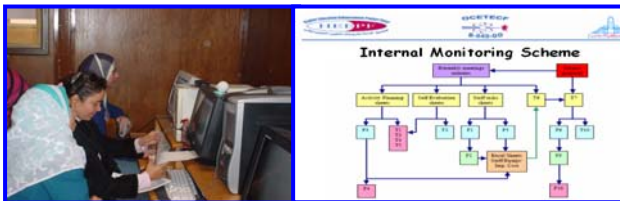


Fig. (6-23): center of excellence for the development of Luminary Communication Technology and Electro-luminary Engineering, Faculty of Engineering, Ain Shams Univ. (Project B-040-G0)

Among the specialized centers in Ain Shams Univ. was a center for improving engineers' technical skills of data analysis and writing proposals. The center was established through Project (A-099-G0) (Figure 6.24).



Figure (6-24): Center for improving engineers' technical skills of data analysis and writing proposals, Faculty of Engineering, Ain Shams Univ. (Project A-

In the Faculty of Engineering, Alex. Univ., a water desalination center was established through Project (C-096-H0). It includes the first integrated lab in Egypt for water desalination using traditional methods as well as new, renewable energy. The center trains students on using different methods of water desalination and offers an industrial/academic training program on Water Desalination Technology (Figure 6.25).



Figure (6-25): Models in the water desalination center, Faculty of Engineering, Alex. Univ. (Project C-096-H0)



Fig. (6-26): Center for improving Transportation Engineering education, Faculty of Engineering, Menya Univ. (Project C-005-M0)

In Minia Univ., a center for improving Transportation Engineering education through the study of field problems, test, and building models was established through Project (C-005-M0) (Figure 6.26). The center aims at doing technical and implementation studies in several Advanced Engineering applications that the society needs. The studies are divided into three axes:

First: offering the technical support or training necessary for whoever is in charge of implementing research projects or education enhancement projects.

Second: offering advanced training for students and engineers in different specializations.

Third: presenting the engineering studies and designs of the community and environment service projects.

In the Faculty of Engineering, Southern Valley Univ., a center for training on the use of designing tools using the computer was established to improve teaching and training in the field of Electrical Engineering through Project (D-147-P2) (Figure 6.27). The center was enhanced with a number of designing software programs such as (ETAP 5.3, OrCAD 10.5, Boson NetSim 6, EMU8086, PSIM).

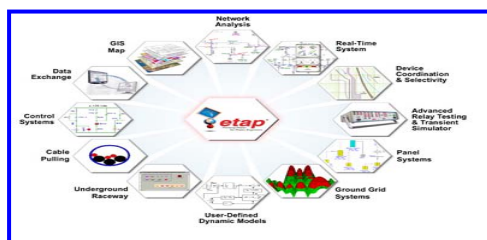


Fig.(6.27): an example of the software programs purchased for the center for training on the use of designing tools using the computer, Southern Valley Univ. (Project D-147-P2).

6.4 Specialized Centers in the Agricultural and Veterinary Medicine Sector

11 centers were established in the Agricultural and Veterinary Medicine Sector in some universities. Alex. University established 4 of these centers: three in the Faculty of Agriculture and one in the Faculty of Veterinary Medicine. Among the centers established in the Faculty of Agriculture are centers in the field of new and renewable energy and animal production. Concerning the field of new and renewable energy which includes wind and solar energy, Project (A-095-H0) and (D-097-H0) established two centers for wind and solar energy.

The two centers contributed in the process of training and students increasing their awareness of the uses of renewable energy through a laboratory training program for wind and solar energy techniques. The program aimed at increasing students' awareness of the uses of solar energy in everyday life and giving them the practical skills necessary for solving the problems that arise from traditional energy. The two centers are equipped with the latest solar energy equipment and meteorological station. In addition, the centers established a website for the courses taught to serve as a nucleus for e-learning.



Fig. (6-28): Some equipment used on the electronic page for the project of establishing two centers for wind and solar energy in the Faculty of Agriculture, Alex. Univ. Projects no. (A-095-H0) and (D-097-H0)

The third specialized center was established in the Faculty of Agriculture through Project (B-004-H0) for training students on the latest techniques in the field of animal production such as sonar and hormone analysis equipment (Figure 6.29). The center trained 350 students in different academic years on modern technology in the field of animal production during the implementation of the project. A number of protocols were signed with Sakha station for animal production for field training which contributed in upgrading the practical performance of students in the Animal Production Department.

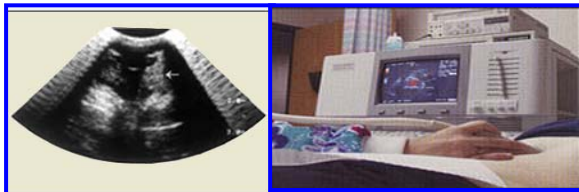


Fig. (6-29): Center for training students on the latest techniques in the field of animal production, Faculty of Agriculture, Alex. Univ. (Project B-004-H0)

In the Faculty of Veterinary Medicine, Alex . University, a teaching center for Veterinary Medicine was established through Project (D-075-H0) using digital techniques and information exchange and communication network technology. One of the criteria for the success of this center was annexing the Faculty of Veterinary Medicine to the Intl. CLIVE Institution for Veterinary Medicine.



Fig. (6-30): Teaching center for Veterinary Medicine in Edfina, Alex. Univ. (Project D-075-H0)

In the Faculty of Agriculture, Cairo University, a specialized center in the field of Biotechnology was established through Project (A-056-J0) to develop the Agricultural Biological Technology curriculum for the undergraduate stage. The center aims at developing the staff members' skills in the field of Biotechnology. It also aims at preparing distinguished graduates in the field of Biotechnology who can highly compete in the labor market (Figure 6.31).



Fig. (6-31): Examples of the contents of the Biotechnology center, Faculty of Agriculture, Cairo Univ. (Project A-056-J0)

In the Faculty of Veterinary Medicine, Zagazig University, a center for the production of plastics was established through Project (B-053-T0) with an aim to prepare anatomical samples of different animal organs (Figure 6.32). These samples are used in teaching because they are easy to handle, are not damaged as a result of overuse, and safer as they do not emanate foul odors or fumes as is the case when using traditional samples of foraminated organs. Numerous studies have proved the benefits of this method in training learners of anatomical sciences. Such plastic samples can be used in the Faculties of Medicine, Veterinary Medicine, Science, Agriculture, and Science Departments in the Faculty of Education. The cream of staff members in Cairo, Assiut, Alex. and Zagazig Universities together with their counterparts in Vienna Univ. in Austria and Munich Univ. in Germany participated in this field. The outcome of the project were declared in the International Conference for the Intl. Society for The Production of Plastics in Vienna in 2006.

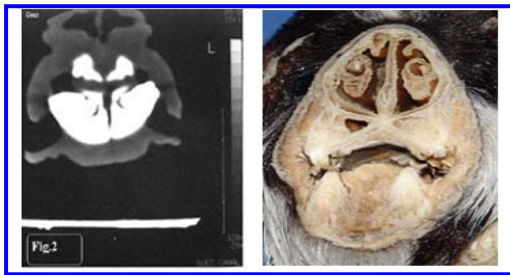


Fig. (6-32): Examples of the samples in the center of excellence in the field of Plastics, Faculty of Veterinary Medicine, Zagazig Univ. (Project B-053-T0)

In the field of modern laboratories, Menoufyia University established movable Veterinary laboratories through Project (A-041-N0). The laboratories included the latest medical equipment necessary for curing sick cases in different places (Figure 6.33). It aims at:

- providing students with field training
- connecting to the fields of scientific research
- training Veterinarians in Veterinary Units on the latest technology in the field of Veterinary Medicine



Fig. (6-33): An advanced center in the field of Veterinary Medicine and movable veterinary clinics, Faculty of Veterinary Medicine, Menoufyia Univ. (Project A-041-N0)

In the field of developing postgraduate studies, the Faculty of Veterinary Medicine, Beni Suef Univ., established a Pathology Center through Project (A-001-J0) (Figure 6.34) where:

- a bank in the Pathology Department was established including referential sections, pathological tissues, and two digital courses: (Human Organs Pathology and Animal Pathology)
- a bank of questions in the field Pathology using specialized software
- setting a database for pathological photos of stock, goats, and camels to be used in the quick diagnosis of different diseases, as well as printing CDs that include advanced photos and information in the fields related to Pathology

- setting a database for contagious diseases that infect farm animals in Egypt and are recorded in published research to be used in preparing Master's Degree and Doctorate theses, as well as establishing a digital library that includes various important theoretical and applied topics with photos



Fig. (6-34): Advanced equipment in the Pathology lab

In the faculty of Agriculture, Minia University, a center for the preparation of teaching media was established through Project (C-008-M0) (Figure 6.35) aiming at:

- providing the faculties of the University with their needs of teaching media
- securing the universities' and schools' needs of teaching media
- saving finance for the development of the center and maintenance of equipment



Fig. (6-35): Center for the preparation of teaching media, Menya University

In the faculty of Veterinary Medicine, Assiut Univ., the Egyptian center for food safety and man's health was established through Project (C-068-10). The center aims at ensuring food safety and protection from microbes and informing specialists in the fields of food and man's health.



Figure (6-36): Data around the Egyptian center for food safety and man's health, Assiut Univ. (Project C-068-10)

6.5 Specialized Centers in the Basic Sciences Sector

In the Basic Sciences Sector, 7 centers were established. of these, 4 specialized centers were established in the Faculty of Science, Assiut Univ. The first was established through Project (C-067-10) as a model example of Analytical Chemistry laboratories which satisfy the requirements of international accreditation of analytical laboratories and follow the quality criteria of the University Analytical Chemistry laboratories (Figure 6.37). The outcome of this experience was the preparation of highly qualified students in theoretical study and increasing their skills and competency to gain more technical job opportunities.



Fig. (6-37): Analytical Chemistry lab, Faculty of Science, Assiut Univ. (Project C-067-10)

In the framework of using modern technology and multimedia in the education process, a center for multimedia and scientific resources was established in the Faculty of Science, Assiut Univ., through Project (B-051-I0). The center aims at developing the education process through training and upgrading the skills of staff members and their assistants as well as providing them with technical service for the preparation of digital courses using multimedia and datashow equipment for presenting them in lecture halls and practical lessons (Figure 6.38).

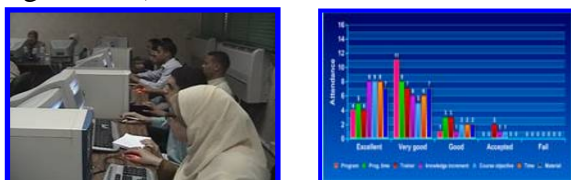


Fig. (6-38): Some trainees in the center for multimedia and scientific resources, Assiut Univ., (Project B-051-I0)

In the Department of Zoology in the Faculty of Science, Assiut Univ., an Egyptian Phonemic Museum was established through Project (D-090-I0) where groups were classified that reflect Egyptian biological and phonemic diversity (Figure 6.39). The project also set up an electronic database for Egyptian Phonemics and related research published on the internet to serve students and scientific research.



Fig. (6-39): Classified groups that reflect biological diversity and Egyptian Phona, Faculty of Science, Assiut Univ. (Project D-090-I0)

The fourth center in Assiut Univ. was established in the Faculty of Science through Project (A-082-I0). It contributes in upgrading the skills of staff members and their assistants in the field of electronic dissemination. The center was accredited as an electronic dissemination unit in the University and helped prepare 13 courses using electronic administration system (Figure 6.40).



Fig.(6-40): Examples of some courses produced through the electronic dissemination center, Assiut Univ. (Project A-082-I0).

In the field of Biological and Biotechnology Sciences, a Biotechnology training center was established in the Higher Studies Institute in Alex. Univ. through Project (B-104-H0) (Figure 6.41). It trained more than 500 trainees in the field of Biotechnology and exerted efforts to sign a protocol with the Ministry of Education to train Secondary School teachers.

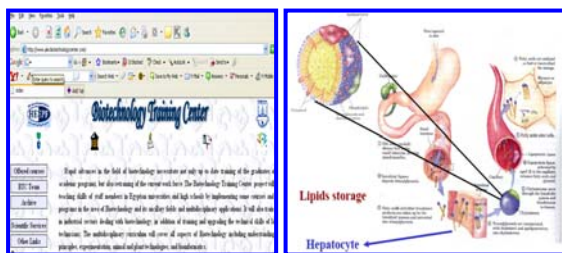


Fig. (6-41): Data about the Biotechnology training center (Project B-104-H0)

In the Faculty of Science, Sohag Univ., two centers were established: one through Project (B-099-P1) to train secondary school teachers through Experimental Sciences and technology programs. The project also signed protocols with the Ministry of Education to train secondary school teachers (Figure 6.42).



Fig. (6-42): secondary school teachers training center, Sohag Univ. (Project B-099-P1)

As for the second center, it is a training center on improving genetics established through Project (B-035-P1) for training on laboratory techniques and tissue and cell agricultures (Figure 6. 43).



Fig. (6-43): Training center on improving genetics, Sohag Univ. (Project B-035-P1)

6.6 Specialized Centers in the Theoretical Specializations Sector

In theoretical specializations, 12 specialized centers were established. In the Faculty of Arts, Zagazig Univ., a center for the development of Geographic Information Systems (GIS) and Environment and Radio Sensation Program (ERS) was established through Project (A-028-T0) (Figure 6.44). The center aims at:

- enhancing the Geographic Information Systems (GIS) and Environment and Radio Sensation Program (ERS) sections
- training staff members, their assistants, and students on the level of the department, university, and other universities on using Geographic Information Systems (GIS) and Environment and Radio Sensation Program (ERS) and their various applications
- setting a database for Sharqeya Governorate to serve as a reference for researchers and decision makers on all levels and offer services to the community
- exchanging experiences with foreign universities in the fields of Geographic Information Systems (GIS) and Environment and Radio Sensation Program (ERS)



Fig. (6-44): Data about the center for the development of Geographic Information Systems, Zagazig Univ. (Project A-028-T0)

In the Faculty of Tourism, Menoufyia Univ., a high quality training center was established through Project (D-174-N0) (Figure 6.45). The center was equipped with the latest techniques in the tourist market such as simulators of the latest technological reservation systems in tourism agencies and airways, simulators of some tourist sites (around 107 monuments and museums), and simulators of reservation and administration systems in hotels. It also aimed at cooperating with similar faculties in the EU to help upgrade graduates' skills.



Fig. (6-45): Electronic page of the high quality training center for the latest techniques in the tourist market, Faculty of Tourism, Menoufyia Univ. (Project D-174-N0)

In the Faculty of Music Education, Helwan Univ., a training center on ancient Egyptian music was established through Project (C-039-K0). Through this center, a database was established through visiting ancient Egyptian tombs and temples.



Fig. (6-46): Training center on ancient Egyptian music, Faculty of Music Education, Helwan Univ. (Project C-039-K0)

In the Faculty of Domestic Economy, Helwan Univ., a training center in the field of leather products was established through Project (D-058-K0). Since academic study and training on this industry is not available in any other education institution in Egypt, the project provided the machines and equipment that ensure providing the labor market with highly qualified graduates, which reflects on the quality of the final products (Figure 6.47).

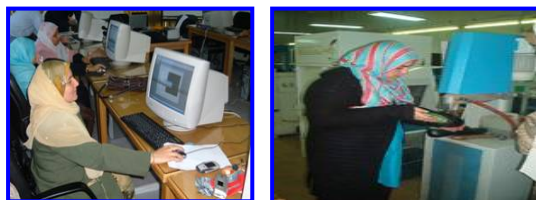


Fig. (6-47): Training center in the field of leather products, Faculty of Domestic Economy, Helwan Univ. (Project D-058-K0).

In the Faculty of Law, Ain Shams Univ., a simulating center of a partially electronic training court was established through Project (C-087-G0). The center simulates the procedures of the real court to train students on pleadings before graduation.

In Ain Shams University, an electronic vision center was established through Project (D-149-G0) to hold courses for blind students in the Faculty of Arts, train them on vision software to enable them to read and write any text, and turn courses into an adequately digital “Ibsar” (Figure 6.48). The University leaderships supported and equipped the center and provided it with an adequate headquarters.



Fig. (6-48): Electronic vision center, Faculty of Law, Ain Shams Univ. (Project C-087-G0)

In Tanta University, A quality management center was established through Project (B-014-S0) (Figure 6.49). The center contributed in the initial application of an overall quality system in the university starting with the Faculties of Education, Veterinary Medicine, and Agriculture.



Figure (6-49): The Minister of Higher Education in the Quality Management Center, Tanta Univ., (Project B-014-S0)

Examples of other quality centers are the center established in Helwan University through Project (B-131-K0). This center was transformed into a special unit.

In the Faculty of Children Kindergarten, Fayoum Univ., a center for teaching media was established through Project (D-146-J0) to develop skills courses and train the kindergarten teacher. The project aims at upgrading the skills of staff members and their assistants to develop skills courses that train and qualify the kindergarten teacher (Figure 6. 50).



Figure (6-50): Center for teaching media, Faculty of Children Kindergarten, Fayoum Univ. (Project D-146-J0)

6.7 Specialized Centers in the Field of Information & Communication Technology

One of the fundamentals of the higher education enhancement process is diversifying information sources provided to students and staff members in different fields. 6 projects distributed on the different cycles of HEEPF first phase provided information sources. It is worth noting that a number of virtual labs in the field of information and communication technology were established for developing digital courses. Positive examples of these labs is the one established in the Faculty of Education, Helwan university, through the Virtual Diploma Project (A-011-K0) as a precedent in Egypt. The lab led to the development of Arabic Language Diploma courses and offering them for distance learning (Figure 6.51). The courses address the unique nature of education administration in the Arab world and are characterized with their high quality that enable graduates to work with the Diploma certificate and continue their higher studies in any Arab country.

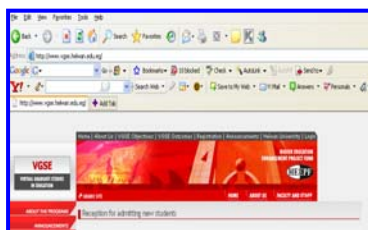


Fig. (6-51): Website for the Virtual Diploma Project (A-011-K0), Helwan Univ.

Through Project (B-029-K0), an already existing center for using education techniques in Helwan University was enhanced and provided with information infrastructure, modern technological media and communication means. It also provided staff members and workers

with training and continuing education on electronic media and education technology to be used as an advanced education tool to enhance the education process in the University (Figure 6.52). Through this center, 15 digital courses were prepared.



Fig. (6-52): Website for center for using education techniques in Helwan Univ. (Project B-029-K0)

In the Faculty of Medicine, Cairo Univ., a joint digital medical library was established through Project (C-081-J0). Seven libraries in seven Faculties of Medicine in the Universities of (Cairo, Suez Canal, Alex., Zagazig, Menya, Fayoum, and Beni Suef) participated in this project through which the library contents are transformed into a digital version that is made available through a network that connects the participating libraries to exchange their contents (Figure6.53).



Fig. (53): The joint digital medical library, Faculty of Medicine, Cairo Univ. (Project C-081-J0)

In this framework, a library administration program was developed and personnel were trained on it. This collaboration of medical libraries is considered a nucleus for connecting to foreign libraries where Egyptian scientific production is presented to the world and exchanged with its foreign counterpart. The Faculty of Medicine in Cairo University was chosen as a principal center for the joint digital medical library where information are saved on the project Servers and the infrastructure established in the Faculty through the coordination and collaboration of a number of HEEP projects are made use of.

In Assiut University, modern technology and multimedia were used in the education process through Project (B-051-I0). The project established a center that aimed at the development of the education process through upgrading the skills of staff members and their assistants, providing them with technical service to prepare electronic courses using multimedia and datashow equipment to present these courses in lecture halls and practical lessons, and establishing a number of websites for the different centers in the university to offer excellent education service that cope with this advanced era (Figure 6.54).



Fig. (6-54): Website for modern technology and multimedia center, Assiut Univ. (Project B-051-I0)

In the Faculty of Education, Tanta University, a center for e-learning and information technology was established through Project (A-011-S0). In this center, training courses for staff members in Tanta University were held and 16 electronic courses in different specializations in the faculties of the University were developed (Figure 6.55).



Fig. (6-55): Website for the center for e-learning and information technology, Tanta Univ. (Project A-011-S0)

The electronic vision center that was established in the Faculty of Education through Project (D-149-G0) is an obvious example of centers in the field of information and communication technology that help blind students and train them on the vision system to be able to read and write any text as mentioned earlier in the field of theoretical specializations.



Fig. (6-56): Website for the electronic vision center, Ain Shams Univ. Project (D-149-G0)

6.8 General Vision of Upgrading Specialized Centers to Become Centers of Excellence

The goals of HEEPF projects are not restricted to the establishment, support, and provision of such centers with sustainability mechanisms. Rather, HEEPF work extends to the continual support and development of these centers to transform them into centers of excellence. HEEPF vision in this context is seen through answering two important questions:

1. What is a center of excellence in the field of science and technology?
2. What are the criteria that should be fulfilled to consider a center excellent?

To answer these questions, a number of studies were conducted such as the one presented in the Exceptional Conference for African Prime Ministers Responsible for Science and Technology that was held in Cairo, Egypt, 20-24 November, 2006.

However, it is not easy to define a center of excellence in the field of science and technology without identifying the main characteristics and features of the institutions that have excellence or aim at reaching it to compare with in the field of science and technology. Therefore, it is necessary to identify the following main features:

1. Institutional identity
2. The ability to support a large number of scientists and/or technicians and inventors in the field of science and technology on the regional and international level
3. A renewable administrative structure that has obvious mechanisms and a functional hierarchy in making decisions
4. Clear roles in human development through increasing extensive knowledge of science or producing specific products in the framework of the national or international economic system
5. Stability of performance and finance within a specific period of time.
6. A clear organizational activity to cope with and affect the outward environment or a clear ability to renovate or develop even in the light of unsatisfactory circumstances.
7. An institutional clarity judged according to the ability to communicate in the framework of a network connection, i.e. the ability to establish and enhance productive collaboration with other institutions
8. The correspondence of the tasks, programs, and outcome of the center with continual development goals

9. Identifying the international criteria and the limits of comparison with similar world centers
10. Setting executive programs (production, training, and research) and identifying the performance signals and work periods

A center of excellence can take one of the following forms:

- a. Groups of people in various specializations in different education institutions (governmental and nongovernmental). These groups can be gathered to solve specific quality problems in the context of the work nature
- b. The currently existing centers or units the facilities, experiences, and structures of which can be made use of to implement a specific program
- c. Individual centers in a department of a faculty or institute or specialized centers in education institutions.

To answer the second question, we can have a look at the performance signals as criteria that can be used to judge whether a center is excellent. These signals can be identified as follows:

1. Scientific Outcome:

- The number of peer-reviewed publications
- The number of national and international patents
- The percentage of projects devoted to continual development goals such as environment protection, improving water quality, saving energy consumption
- The level of scientific excellence as defined by a foreign evaluation expert on the basis of peer-review
- The relation between the center's building capacity and the number of past-doctorate scientists.

2. Capacity Building Signals:

a. Human Resource Development

- Percentage of those who got training in advanced fields
- Percentage of those who are trained to gain higher degrees
- Evaluation of the trained

b. Network Connection

- The number of distinguished institutions that positively interact with the center (exchanging personnel and information and joint activities, etc) both inside and outside
- The number of scientific occasions attended both inside and outside
- Percentage of the budget allocated to interaction inside and outside

c. Relations with the Government and Financing Agencies:

- Evaluating relations by an external evaluating expert

Indices show that any center of excellence is a highly influential institution or network that can efficiently and effectively solve problems or contribute in the solution of specific quality problems. To reach the level of a center of excellence, high and remarkable levels of scientific production and invention have to be achieved based on the given criteria. Moreover, the existing structures have to be developed and activities that are directed towards ability building have to be done. This can be understood as:

1. improving the kind and quality of human resources on whom excellent scientific outcome depend

2. expanding the framework of knowledge through a network connection with the international scientific community and other means
3. Communication with financing sources to help expand and improve. Hence, having a satisfactory competence in the process of ability building is considered an essential quality to reach the level of excellence.

HEEPF looks forward to turning all HEEPf financed specialized centers into centers of excellence, and many of these centers have the potentials for that. HEEPf will always be ready to support these centers to develop their capabilities and outcome to reach the level of the centers of excellence. Since the aim of transforming these centers into centers of excellence is to create a well-established base for research and development on the hand of Egyptian experts in different specializations, such research can benefit local institutions.